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GRAPHICS MODIFICATIONS TO THE U.S. BUREAU OF MINES MONVER3.BAS SUBSIDENCE PREDICTION PROGRAM

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GRAPHICS MODIFICATIONS TO THE U.S. BUREAU OF MINES MONVER3.BAS SUBSIDENCE PREDICTION PROGRAM

by

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SUMMARY

The report outlines a series of modifications to the U.S. Bureau of Mines MONVER3.BAS subsidence prediction program to allow the calculated subsidence, inclination and curvature parameters to be graphed on an HP7475A plotter.

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MODIFICATION DU LOGICIEL GRAPHIQUE DU PROGRAMME MONVER3.BAS RÉALISÉ PAR LE U.S. BUREAU OF MINES POUR PRÉDIRE LA SUBSIDENCE

par

B. Keddy* et T.R.C. Aston**

RÉSUMÉ

Le rapport comprend les grandes lignes d'une série de modifications qui ont été apportées au programme MONVER3.BAS, réalisé par le U.S. Bureau of Mines pour prédire la subsidence. Ces modifications permettront de représenter sous forme graphique les calculs de la subsidence et de l'inclinaison et les paramètres des courbes, sur la table traçante HP7475A.

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INTRODUCTION

In June 1987, a copy of the U.S. Bureau of Mines computer program MONVER3.BAS was obtained by the Cape Breton Coal Research Laboratory (CBCRL). The MONVER3.BAS program represents an empirical model, based on Bals' theory, for the prediction of longwall mining subsidence profiles in the Northern Appalachian Coalfield (1). The program was developed for use on an IBM compatible microcomputer and has been widely distributed to U.S. coal mining companies. It is important to note that the MONVER3.BAS program was developed for use with imperial unit input data.

At CBCRL, the MONVER3.BAS program is used on an IBM-PC/AT microcomputer with an EPSON FX100 dot matrix printer. However, the program only allows graphs of the calculated subsidence, inclination (slope) and curvature parameters to be produced on the printer.

This report outlines a series of modifications made to the MONVER3.BAS program to allow the calculated subsidence, inclination and curvature parameters to be graphed on an HP7475A plotter. The user is expected to be familar with longwall mining subsidence prediction and the use/operation of an IBM compatible microcomputer with accompanying SYMPHONY software.

PROGRAM MODIFICATION AND OPERATION

The MONVER3.BAS program calculates three parameters when a longwall mining configuration is run: subsidence, inclination and curvature. The program has been modified so that when the desired parameter is displayed graphically on the screen, a data file is created. Each data file contains three columns: panel width, predicted value and the inverse predicted value. For subsidence, the data file created is called 'SUBSID', while for curvature and inclination the files are 'CURVATUR' and 'INCLINE' respectively.

Once the desired data file is created, the next stage is to Import it to the 'SYMPHONY' program using the structured file Import option. Once this is completed, press F 10 and enter the graphics module (press GO). Graphical setting sheets must now be created and the Type of Graph required decided. The first setting sheet mode is then accessed and an X-Y type graph

selected. It is important to set the range for the X and Y axes. The second setting sheet mode is then accessed via Switch. It should be noted that many of the option default values are adequate for graphics production. Once the second setting sheet mode is accessed, the graph can be previewed on the screen, but it is important to: 1) do an 'Image-Save' of the screen image (any file name will suffice) and 2) save the spread sheet file created.

The Print Graph module is then accessed and ensuring that the graphics-directory is the same one in which the original *pic files were stored, an 'Image-Select' is performed and the desired picture file selected. If the plotter is switched on and contains paper, press GO and the space bar in order to plot the graph.

RESULTS

To demonstrate the use of the MONVER3.BAS program, the Prince Mine 1 East panel was used as a test case (Panel Width - 200 ft, Extracted Seam Height - 6.3 ft and Overburden Thickness - 525 ft). Table 1 shows the predicted subsidence values, while Table 2 gives the predicted inclination and curvation at intervals from the panel centreline.

Figure 1 shows the predicted subsidence, while Figures 2 and 3 show the predicted inclination and curvature in graphical form.

REFERENCES

1. Adamek, V. and Jeran, P.W. "Precalculation of subsidence over longwall panels in the Northern Appalachian Coal Region"; Mine Subsidence Control. Proceedings: Bureau of Mines Technology Transfer Seminar; Pittsburgh, Pa; September 19, 1985; U.S. Bureau of Mines Information Circular No. 9042.

Prince 1 East Panel

THE THICKNESS OF COAL EXTRACTED IS 6.3 FEET.

THE WIDTH OF THE LONGWALL PANEL IS 200 FEET.

DISTANCE FROM EDGE OF PANEL	OVERBURDEN (feet)	SUBSIDENCE (feet)
-100	525	.12
-90	525	.14
-80	525	.16
-70	525	.18
-60	525	.2
-50	525	.22
-40	525	.25
-30	525	.28
-20	525	.31
-10	525	.35
0	525	.4
10	525	.46
20	525	.51
30	525	.56
40	525	.62
50	525	.69
60	525	.76
70	525	.85
80	525	.93
90	525	1.02
100	525	1.11

Table 1 - Predicted subsidence values, 1 East panel, Prince Mine

Prince 1 East Panel

THE THICKNESS OF COAL EXTRACTED IS 6.3 FEET.

THE WIDTH OF THE LONGWALL PANEL IS 200 FEET.

DISTANCE FROM EDGE OF PANEL	INCLINATION (mm/m)	DISTANCE FROM EDGE OF PANEL	CURVATURE (1/km)
-95	1.63	-90	.08
-85	1.88	-80	.04
-75	2	-70	.07
-65	2.24	-60	.02
-55	2.31	-50	.11
-45	2.66	-40	.08
-35	2.91	-30	.13
-25	3.33	-20	.07
-15	3.55	-10	.65
-5	5.54	0	.03
5	5.65	10	-.32
15	4.68	20	.23
25	5.4	30	.16
35	5.91	40	.28
45	6.79	50	.21
55	7.44	60	.27
65	8.270001	70	.1
75	8.59	80	.12
85	8.97	90	.11
95	9.309999	9999999	9999999

Table 2 - Predicted inclination and curvature values, 1 East panel, Prince Mine

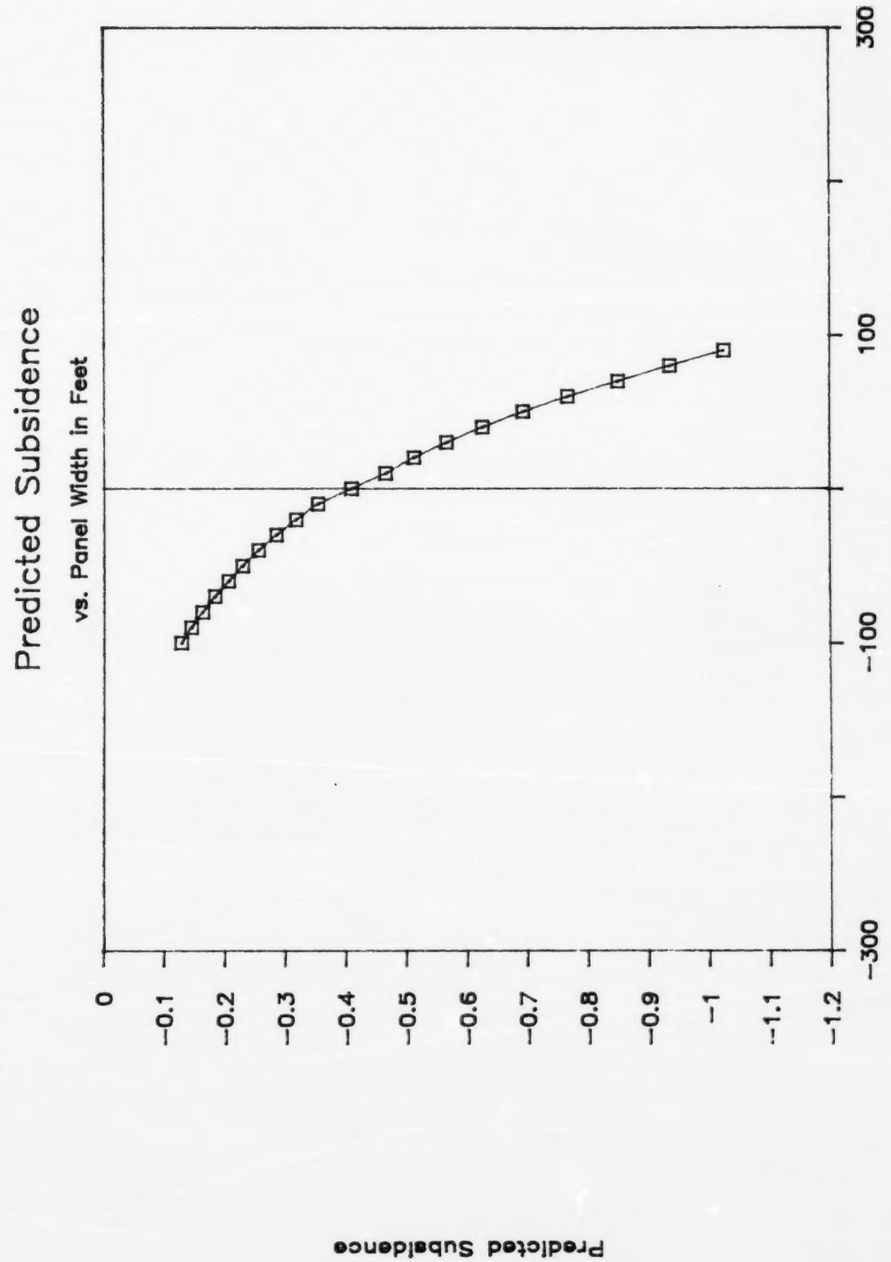

Figure 1 - Predicted subsidence values, 1 East panel, Prince Mine

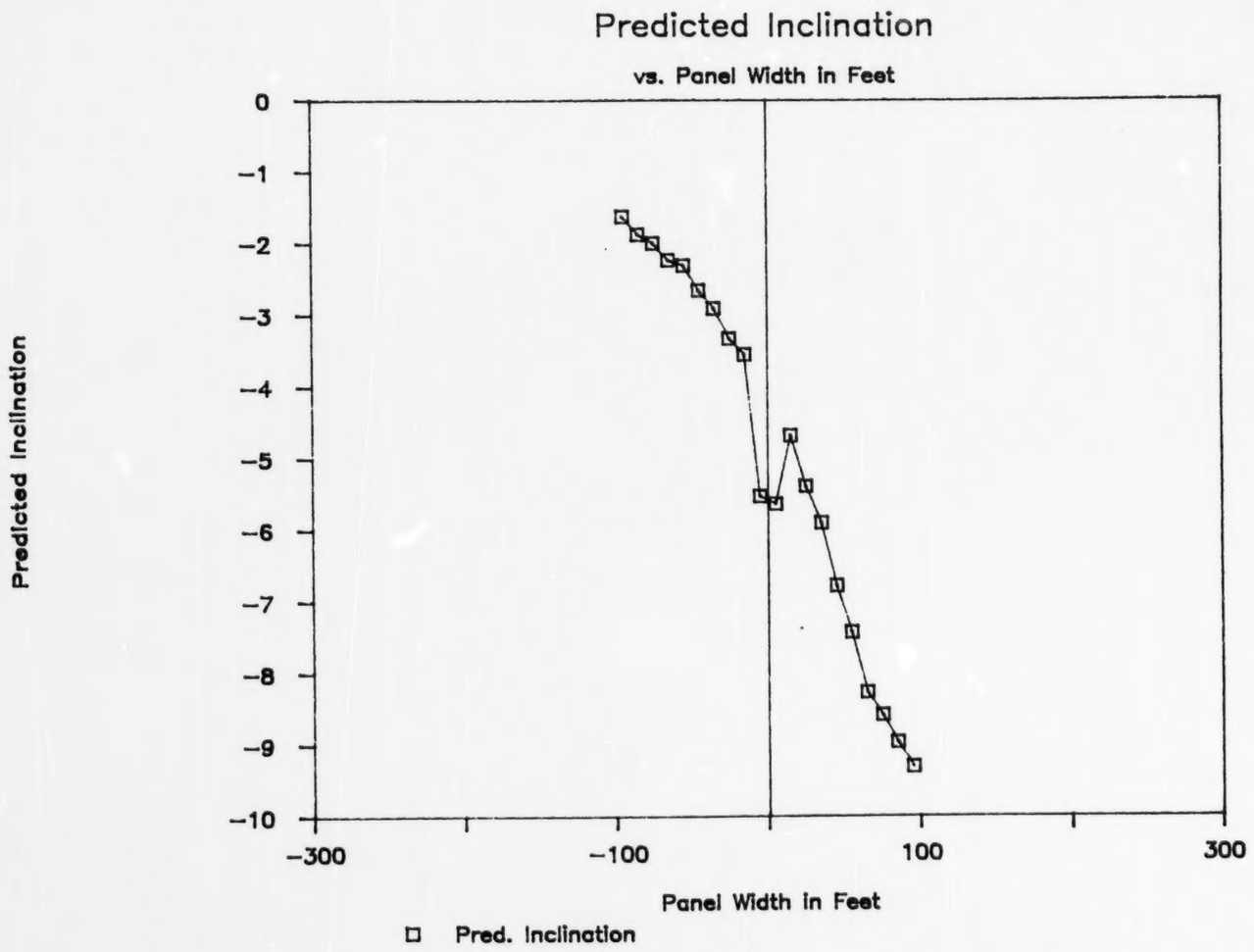

Figure 2 - Predicted inclination values, 1 East panel, Prince Mine

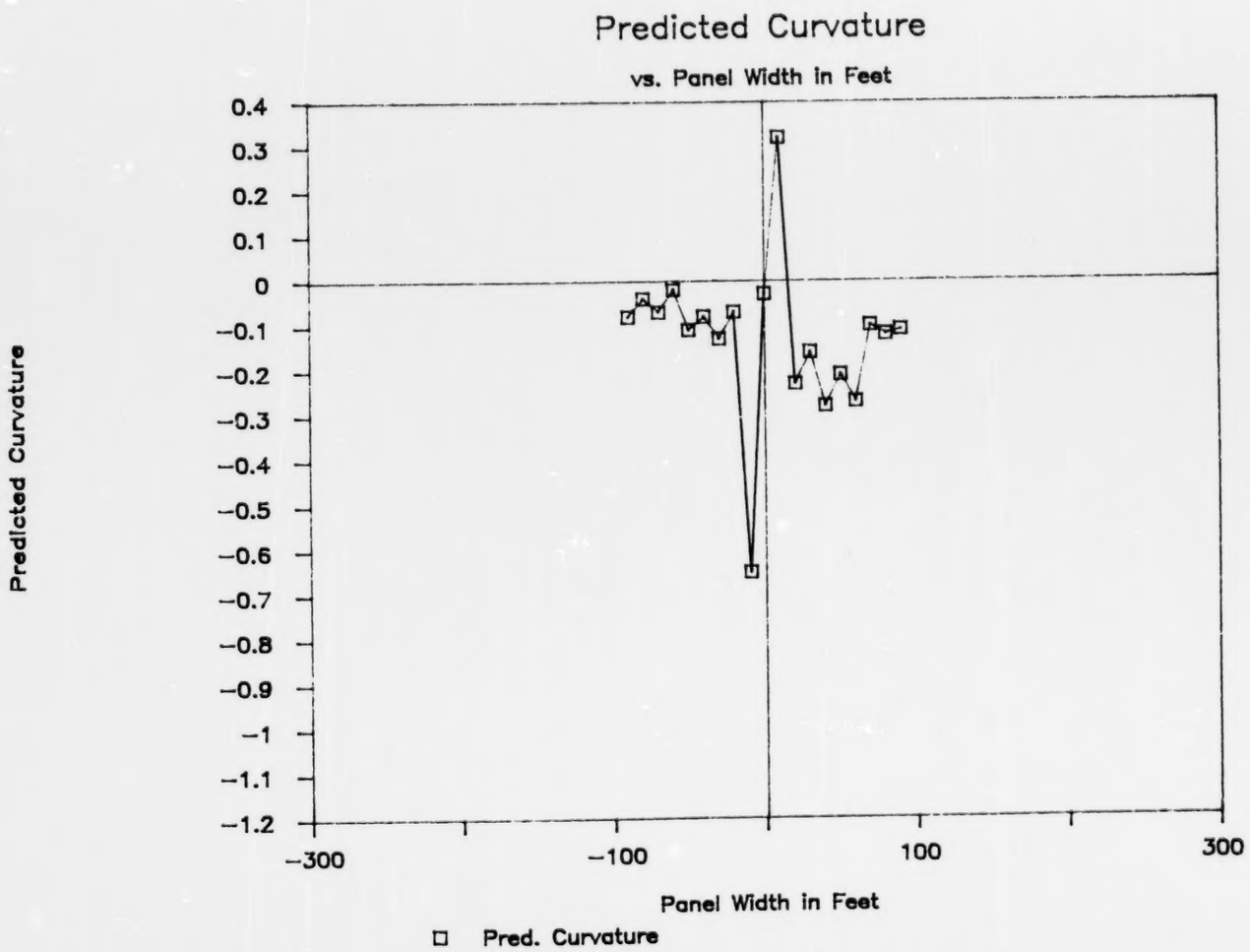

Figure 3 - Predicted curvature values, 1 East panel, Prince Mine